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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,295	12/02/2003	Yao-Dong Ma		5333

7590
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EXAMINER

PERVAN, MICHAEL

ART UNIT PAPER NUMBER

2629

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/727,295	Applicant(s) MA, YAO-DONG	
	Examiner Michael Pervan	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81(c). No new matter may be introduced in the required drawing. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

Claim Objections

2. Claim 14 is objected to because of the following informalities: "generate" on line 4 should instead be –generates–. Appropriate correction is required.
3. Claim 16 is objected to because of the following informalities: "super" on line 1 should instead be –superior–. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1 and 14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In regards to claim 1, "the rms addressing requirement" is not supported by the specification. Even though page 2, line 23-page 3, line 8 and page 7, line 24-page 8, line 7 refer to "the rms addressing requirement", it is unclear from the applicant's disclosure as to what "rms addressing" and "the rms addressing requirement" are.

In regards to claim 14, "a high frequency frame inverting circuit" is not supported by the specification. The examiner was unable to find any reference to "a high frequency frame inverting circuit". Therefore, it is unclear from the applicant's disclosure as to what "a high frequency frame inverting circuit" is and how it operates.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 2-3, 10, 14 16-17 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claim 2, it recites the limitation "2-5 μm , more preferably, 3-4 μm " in line 2. This is indefinite since it is unclear as to which thickness is being claimed.

In regards to claims 3 and 10, they recite the limitation "value of 0.2-0.3, more preferably, 0.23-0.27" in line 2. This is indefinite since it is unclear as to which birefringence value is being claimed.

In regards to claims 14 and 16, they recite the limitation "superior output capability" in line 3. This is indefinite since it is unclear why and what the output capability is superior to.

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In regards to claim 17, it recites the limitation "two times more than the prior art" in line 2. This is indefinite since there could exist in the prior art a frame rate higher than 60 Hz, therefore 120 Hz would no longer be two times higher.

In regards to claim 20, it recites the limitation "the electronic driving circuitry" in line 1. There is insufficient antecedent basis for this limitation in the claim. However for examination purposes, the examiner will treat claim 20 as if it depends off of claim 14.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-12 and 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al (US 5,058,998) in view of Tanaka et al (US 5,900,852) in further view of Ilcisin et al (US 5,414,440).

In regards to claim 1, Yoshida discloses an ultra fast display cell structure comprising:

- a. a super thin inner cell spacing (liquid crystal layer) (col. 5, lines 58-60);
- b. a twisted nematic liquid crystal film with low viscosity and high optical anisotropy and low dielectric anisotropy (tables 5 and 6, example 10; the twist angle is greater than 90 degrees, therefore it's a super twisted nematic LC. The viscosity of LC IV is low compared to that of LC III. The optical anisotropy of LC IV is high compared to that of LC III);

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c. a passive electronic driving circuitry with a waveform of ultra high frame-rate (table 5, example 10; the frame rate is 120 Hz);

wherein the liquid crystal film filled into the cell spacing is satisfied substantially with a super twisted angular and optical configurations (table 5, example 10; since the twist angle is greater than 90 degrees, the LC is satisfied substantially with a super twisted angular and optical configurations); and the high frame rate driving waveform is satisfied substantially with the rms addressing requirement of the ultra fast display cell structure (since the frame rate of the reference is the same as the frame rate listed on page 7 of applicant's disclosure, the high frame rate driving waveform is satisfied substantially with the rms addressing requirement);

whereby a video speed display with high contrast ratio is formed (table 5, example 10; the contrast ratio is 20, which is high compared to the prior art STN-LCD).

Yoshida does not disclose small helical pitch.

Tanaka discloses small helical pitch (col. 10, line 5).

It would have been obvious at the time of invention to modify Yoshida with the teachings of Tanaka, small helical pitch, by incorporating the small helical pitch cell structure of Tanaka into the device of Yoshida because it improves image quality.

Yoshida and Tanaka do not disclose low dielectric anisotropy.

Ilcisin discloses low dielectric anisotropy (col. 6, lines 25-26).

It would have been obvious at the time of invention to modify Yoshida and Tanaka with the teachings of Ilcisin, low dielectric anisotropy, by incorporating the LC

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material of Ilcisin with the device of Yoshida and Tanaka because the low dielectric anisotropy improves image quality (col. 6, lines 49-53).

In regards to claim 2, Yoshida discloses the display as in claim 1 wherein the super thin inner cell spacing is a cell gap (liquid crystal layer) with the thickness of 2-5 μm , more preferably, 3-4 μm (col. 10, lines 9-10).

In regards to claims 3 and 10, Yoshida does not disclose the high optical anisotropy is an optical birefringence, Δn , with a value of 0.2-0.3, more preferably, 0.23-0.27.

However, Yoshida discloses the high optical anisotropy is an optical birefringence, Δn , with a value of 0.107 (table 6, LC IV).

Since the specification does not cite an advantage or benefit to choosing a value from 0.2-0.3, the examiner believes this to be a designer's choice.

In regards to claims 4 and 11, Yoshida does not disclose the low dielectric anisotropy, $\Delta\epsilon$, is in the range of 2-8, which results in high display contrast ratio.

Ilcisin discloses the low dielectric anisotropy, $\Delta\epsilon$, is in the range of 2-8, which results in high display contrast ratio (col. 6, lines 25-26).

It would have been obvious at the time of invention to modify Yoshida with the teachings of Ilcisin, low dielectric anisotropy, by incorporating the LC material of Ilcisin with the device of Yoshida because the low dielectric anisotropy improves image quality (col. 6, lines 49-53).

In regards to claims 5 and 12, Yoshida does not disclose the small helical pitch, p_0 , is in the range of 5-8, which results in fast restoring time.

Tanaka does not disclose the small helical pitch, p_0 , is in the range of 5-8, which results in fast restoring time.

Tanaka discloses the small helical pitch, p_0 , of 3.2, which results in fast restoring time (col. 10, line 5).

Since the specification does not cite an advantage or benefit to choosing a value from 5-8, the examiner believes this to be a designer's choice.

It would have been obvious at the time of invention to modify Yoshida with the teachings of Tanaka, small helical pitch, by incorporating the small helical pitch cell structure of Tanaka into the device of Yoshida because it improves image quality.

In regards to claim 6, Yoshida discloses the display as in claim 1 wherein the ultra high frame rate is the frame rate at least 120 Hz, which is two times higher than the normal frame rate of the STN display (table 5, example 10).

In regards to claim 7, Yoshida discloses the display as in claim 1 wherein the video speed is at least 30 frames per second (table 5, example 10; the frame rate is 120 HZ or 120 frames per second).

In regards to claim 8, Yoshida discloses a liquid crystal characteristics for video rate STN display comprising:

- a. low viscosity (tables 5 and 6, example 10; The viscosity of LC IV is low compared to that of LC III);
- b. high optical birefringence (tables 5 and 6, example 10; The optical birefringence (optical anisotropy) of LC IV is high compared to that of LC III);

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c. high threshold voltage (tables 5 and 6, example 10; the threshold voltage is when compared to that of the prior art STN-LCD);

wherein low viscosity and small helical pitch is for fast response time, high optical birefringence is for the optimal retardation at a thin cell gap and high threshold voltage and low dielectric anisotropy are for the high contrast ratio;

whereby the liquid crystal ensures the video speed display while maintaining high contrast ratio.

Yoshida does not disclose small helical pitch.

Tanaka discloses small helical pitch (col. 10, line 5).

It would have been obvious at the time of invention to modify Yoshida with the teachings of Tanaka, small helical pitch, by incorporating the small helical pitch cell structure of Tanaka into the device of Yoshida because it improves image quality

Yoshida and Tanaka do not disclose low dielectric anisotropy.

Ilcisin discloses low dielectric anisotropy (col. 6, lines 25-26).

It would have been obvious at the time of invention to modify Yoshida and Tanaka with the teachings of Ilcisin, low dielectric anisotropy, by incorporating the LC material of Ilcisin with the device of Yoshida and Tanaka because the low dielectric anisotropy improves image quality (col. 6, lines 49-53).

In regards to claim 9, Yoshida does not disclose the liquid crystal characteristics as in claim 8 wherein the viscosity is in the range of 15-25 cp at 20°C.

Yoshida discloses the liquid crystal characteristics as in claim 8 wherein the viscosity is in the range of 15-25 cp at 25°C (table 6, LC IV).

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Since the specification does not cite an advantage or benefit to choosing the a value from 15-25 cp at 20⁰C, rather than 25⁰C, the examiner believes this to be a designer's choice.

In regards to claim 14, Yoshida discloses an electronic driving circuitry for the video speed STN display comprising:

- a. a row driver (scanning electrodes driver 41) with high frequency response (Figure 19 and col. 16, lines 62-66);
- b. a column driver (signal electrodes driver 42) with superior output capability (Figure 19 and col. 17, lines 1-4);
- c. a controller (timing signal generator) which generates a high frame rate pulses for both row and column drivers through a synchronizing signal (Figure 19 col. 16, line 55-col. 17, line 9);
- d. a high frequency frame inverting circuit to change the polarity of the waveform for off-setting the DC component of the accumulate waveforms;

whereby a high frame rate waveform is generated for the video speed STN display (table 5, example 10; the frame rate is 120 Hz).

In regards to claim 15, the electronic driving circuitry as in claim 14 where the row driver with high frequency response ensures substantially no horizontal cross talk at high frame rate (col. 16, lines 62-65; since the frame rate of the reference is the same as the frame rate on page 7 of the applicant's disclosure, the row driver of Yoshida will also ensure substantially no horizontal cross talk).

In regards to claim 16, the electronic driving circuitry as in claim 14 where the column driver with super output capability ensures substantially no vertical cross talk at high frame rate (col. 17, lines 1-4; since column driver is synched with the row driver the frame rates are the same, which is the same as the frame rate on page 7 of the applicant's disclosure, the column driver of Yoshida will also ensure substantially no vertical cross talk).

In regards to claim 17, Yoshida discloses the electronic driving circuitry as in claim 14 where the high frame rate is at least 120 Hz, which is two times more than the prior art (col. 16, lines 62-65).

In regards to claim 18, Yoshida discloses the electronic driving circuitry as in claim 14 where the high frame rate ensures substantially flicker-free display result (col. 16, lines 62-65; since the frame rate of the reference is the same as the frame rate on page 7 of the applicant's disclosure, the device of Yoshida will also ensure substantially flicker-free display results).

In regards to claim 19, Yoshida discloses the electronic driving circuitry as in claim 14 where the high frame rate ensures substantially no frame response (col. 16, lines 62-65; since the frame rate of the reference is the same as the frame rate on page 7 of the applicant's disclosure, the device of Yoshida will also ensure substantially no frame response).

In regards to claim 20, the electronic driving circuitry for the video speed STN display ensures at least 30 frames of images per second without substantial signal distortion (col. 16, lines 62-65; since the frame rate of the reference is the same as the

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frame rate on page 7 of the applicant's disclosure, the device of Yoshida will also ensure 30 frames per second without substantial signal distortion).

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al (US 5,058,998) in view of () in further view of Nakazawa et al (US 6,144,373).

In regards to claim 13, Yoshida and do not disclose the liquid crystal characteristics as in claim 8 wherein the high contrast ratio is larger than 40:1.

Nakazawa discloses the liquid crystal characteristics as in claim 8 wherein the high contrast ratio is larger than 40:1 (col. 12, lines 65-67).

It would have been obvious at the time of invention to modify Yoshida and with the teachings of Nakazawa, high contrast ratio, by incorporating the driving method of Nakazawa into the device of Yoshida and because the higher the contrast ratio, higher the brightness of the display, which gives better picture quality.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Pervan whose telephone number is (571) 272-0910. The examiner can normally be reached on Monday - Friday between 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MVP

June 29, 2006

AMR A. AWAD
PRIMARY EXAMINER

